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AGRICULTURAL PROGRAMS IN THE HAWAIIAN ISLANDS

REPORT AND RECOMMENDATIONS

OF A

SPECIAL SUBCOMMITTEE

OF THE

COMMITTEE ON AGRICULTURE

OF THE

HOUSE OF REPRESENTATIVES

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FEBRUARY 10, 1953.—Transmitted to the Chairman of the Committee on Agriculture of the House of Representatives

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LETTER OF TRANSMITTAL

HOUSE OF REPRESENTATIVES,
Washington, D. C., February 10, 1953.

Hon. CLIFFORD R. HOPE,
Chairman, Committee on Agriculture,
House of Representatives.

DEAR MR. CHAIRMAN: Transmitted herewith is the report of the special subcommittee appointed by the former chairman of the committee, the Honorable Harold D. Cooley, to observe, study, and investigate agricultural programs in the Hawaiian Islands.

In its report the subcommittee sets forth its findings and suggests certain steps which may be taken to improve agricultural operations in the Hawaiian Islands. Some of the recommendations may necessitate changes in the laws relating to the various programs or changes in the regulations and procedure in the Department of Agriculture.

It is our hope that members of the House Committee on Agriculture and other Members of Congress will study the report and will give careful consideration to the recommendations of the subcommittee.

Our subcommittee desires to commend the former clerk to the committee, Mabel C. Downey, who was of great assistance during the course of our observations, study, and investigations, and in the preparation of this report.

Respectfully submitted.

WILLIAM S. HILL,
Acting Chairman, Special Subcommittee.

AGRICULTURAL PROGRAMS IN THE HAWAIIAN ISLANDS

A special subcommittee was designated by the former chairman of the House Committee on Agriculture, Harold D. Cooley, to go to the Hawaiian Islands and observe, study, and investigate the sugar situation and other agricultural programs carried on in the islands. Mabel C. Downey, clerk to the committee, was designated to accompany members of the subcommittee.

On November 7, 1952, the following members of the subcommittee proceeded to the Hawaiian Islands: William S. Hill, Charles B. Hoeven, and Harold O. Lovre. They were accompanied by Mabel C. Downey, clerk. Other members of the subcommittee, including the chairman, George M. Grant, were unable to join the above-mentioned members; therefore, William S. Hill was acting chairman.

The subcommittee arrived in Honolulu, T. H., November 12, 1952. Thereafter, on the same day, it met with Delegate and member of the House Committee on Agriculture, Joseph R. Farrington, Governor of the Hawaiian Islands, the Honorable Oren E. Long, the mayor of Honolulu, the Honorable John H. Wilson, and representatives of the Hawaiian Cattle Growers Association, the pineapple and sugar growers, the Farm Bureau Federation, small farming industries and Federal and local agricultural agencies. Agricultural problems of the islands were discussed.

Mayor Wilson observed that Hawaii could produce all of the rice consumed in the islands if efforts were made in that direction. He stated that the Territory of Hawaii once supplied rice to California but now imported rice from California; that Hawaii could obtain rice yields double those in California and that old, abandoned taro patches could easily be converted to rice beds with maximum production methods.

The chairman of the subcommittee, Mr. Hill, stressed the importance of keeping both the mainland beet sugar and the Hawaiian cane sugar production at capacity.

On November 13, 1952, at 9:30 a. m., the subcommittee made an official call on Gov. Oren E. Long and discussed with him various phases of agriculture in the Hawaiian Islands. Thereafter they proceeded to the Dole Hawaiian Pineapple Co., Ltd., where they met various officials of the company, with whom they discussed the industry and the problems in connection therewith, and later made a tour of the plant.

The subcommittee was accompanied by Dr. L. D. Baver, director of the experiment station of the Hawaiian Sugar Planters' Association, to the experiment station, where they were shown moving pictures of Hawaii, which included all phases of the sugar industry. Members of the subcommittee were also briefed on the various experiments which had been made and were shown actual experiments in process.

In the afternoon of November 14 members of the subcommittee visited plantations on Oahu Island and observed sugarcane fields, the methods of cultivation, including the irrigation system, fertilization, labor, processing plants, and transportation facilities.

On Saturday, November 15, the subcommittee and Delegate Joseph R. Farrington met with officials of the Production and Marketing Administration, Soil Conservation Service, Extension Service of the University of Hawaii, Board of Agriculture and Forestry, Bureau of Entomology and Plant Quarantine, Hawaii Agricultural Mobilization Committee and Bureau of Animal Industry.

AGRICULTURAL EXTENSION SERVICE

Baron Goto, associate director, Agricultural Extension Service, University of Hawaii, reviewed accomplishments and needs of the Service. He stressed the Extension Service's new role of receiving trainees going to and from the mainland under the point 4 program. He urged that Federal extension leaders make more frequent trips to the Hawaiian Islands. He stated "our budget hasn't been checked for the last two bienniums by Federal officials."

In the appendix may be found Baron Goto's complete statement.

PRODUCTION AND MARKETING ADMINISTRATION

W. N. King, Director of the Production and Marketing Administration, USDA, reviewed the activities of Production and Marketing Administration in the islands and told of work in connection with the administration of the Sugar Act of 1948. He also discussed the soil conservation program and other agricultural programs.

In the appendix may be found Mr. King's complete statement.

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

K. L. Maehler, inspector in charge, Honolulu office, Division of Plant Quarantine, discussed the work and aims of the Division of Plant Quarantine to reduce introduction of pests and diseases to the point that establishment would be unlikely. His complete statement may be found in the appendix.

L. D. Christenson, in charge, investigations of fruitflies in Hawaii, Division of Fruit Insect Investigations, Bureau of Entomology and Plant Quarantine, submitted a statement and described the successful fruitfly fight. He stated that there were yet many problems to be solved. His complete statement may be found in the appendix.

SOIL CONSERVATION SERVICE

Walter E. Sykes, Territorial conservationist, Soil Conservation Service, discussed the soil conservation district situation in Hawaii. He stated that prior to World War II a small staff, under the direction of Dr. N. E. Winters, did considerable soils survey work and conservation practice demonstrations in the islands; that shortly after Pearl Harbor it was decided to stop temporarily Soil Conservation Service work in the Territory of Hawaii; that thereafter a soil conservation district law was passed by the Territorial Legislature, at the 1947

session, and was enacted into law on May 19, 1947; that there were now nine soil conservation districts located on four of the islands—Maui, Oahu, Molokai, and Hawaii—and the acres involved were more than 1,406,000.

Mr. Sykes stated that they had no complaints with regard to the share of appropriated Soil Conservation Service funds which had been provided to Hawaii. He stated, however, that they did not have aerial photograph coverage for a number of sections, and they were badly needed.

After giving a full report, to be found in the appendix, Mr. Sykes stressed the very fine cooperative relationships which existed in Hawaii between Government agencies.

BOARD OF AGRICULTURE AND FORESTRY

C. C. Lennox, president, Board of Agriculture and Forestry, Territory of Hawaii, gave a full report of the functions and activities of the board in the Territory of Hawaii. He stated that functions normally handled by a State Department of Agriculture were vested in the Territorial Board of Agriculture and Forestry; that such board had supervision of animal health and animal quarantines; that they enforced regulations relative to entry of animals into the Territory, as well as between islands of the Territory; that these regulations were well defined and easily enforced because of water barriers at borders; that laws relating to agricultural seeds, economic poisons, feedstuffs, labeling and grading of fresh vegetables, fruits, and eggs, as well as the use of herbicides, were all enforced by agents employed through "this Territorial activity." He stated that Territorial appropriations to support the above-described functions amounted to approximately $330,000, and that no material Federal support was obtained directly to aid in supporting the programs.

Mr. Lennox discussed the forest reserves and the forestry resources of the Territory and stated that they were managed entirely by the board which he represented; that no administrative assistance was obtained from the United States Forest Service, although approximately $10,000 was obtained annually from Federal funds under the Clarke-McNary and Norris-Doxey Acts as grants-in-aid for forest-fire prevention and distribution of forest trees to farmers. He stated that more than 1,000,000 acres, or one-fourth of the total land area of the Territory was in forest reserve, with more than 900,000 acres managed as watersheds for the protection of the Territory's irrigation and domestic water supplies; that the balance of the area was managed for its timber products, game and recreational values, or for soil protection; that about 830,000 acres are Government lands and the balance privately owned lands, placed under the protective custody of the Territory; that the total annual expenditure for forest protection and management was over $300,000.

Mr. Lennox stressed Federal assistance which would aid agricultural expansion in Hawaii. He stated that the Territory was far from self-sufficient in feed crops required by its population, and added that opportunity to expand production of food crops rested to a large extent with the opportunity to bring irrigation water to dry areas of present low production capacity; that private enterprise had invested over $40,000,000 in irrigation works and that such invest-

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ments had been made where repayment was assured in a relatively short period; that large areas of land still remained which could be brought under irrigation if financing were at a low rate of interest and repayment were over a long period of time, as was possible under the Reclamation Act. He called attention to legislation introduced in the last Congress which would have permitted the Bureau of Reclamation to make a full survey of irrigation, power, and flood-control potentials in the Territory, which legislation failed in the Senate. He stated that this assistance at the Federal level would materially expand the opportunity to evaluate the potentials of further land cultivation in Hawaii, and was badly needed.

Mr. Lennox discussed the dairy, poultry, and swine industry in Hawaii and stated that the expansion of these livestock enterprises to meet local consumption was dependent upon a lower cost of livestock feeds and an assured supply. He stated that interruptions of water transportation had created serious hardships to all of these enterprises. He suggested Federal assistance through loans from the Reconstruction Finance Corporation for building of bulk storage facilities for livestock feeds to be stockpiled, and a revision of the authority vested in the Commodity Credit Corporation to permit storage of grains in such facilities, which would materially aid in meeting the problems of livestock enterprises and permit them to expand to meet consumption demands.

Mr. Lennox stated that approximately one-third of the Territorial land was under pasture for the growing of beef cattle; that only 65 percent of local consumption came from beef produced in the islands; that material assistance through the Soil Conservation Service could be obtained from the national level in guiding and assisting with the pasture improvement program; that this was obtained to some extent at present, but more assistance was needed.

BUREAU OF ANIMAL INDUSTRY

The subcommittee heard a report by Dr. A. H. Julien, inspector in charge of Agricultural Research Administration, Bureau of Animal Industry.

Dr. Julien discussed the aims and purposes of the Bureau of Animal Industry—to conduct research and administer a program primarily concerned with the protection and development of the livestock industry of the United States. He stated that they conducted scientific investigations of the causes, prevention, and treatment of diseases and parasites of domestic animals, investigated the existence of such maladies, and directed or aided in their control or eradication; that they carried on experiments in the breeding and feeding of domestic animals, including poultry and fur-bearing animals raised in captivity, and studied methods of improving the quality and usefulness of their products; that they administered Federal acts regarding animal quarantine, diseased animal transportation, and virus-serum toxin; that they administered the Meat Inspection Act, the Horse Meat Act, the Imported Meat Act, and the 28-hour law.

Dr. Julien stated:

> The Bureau of Animal Industry Division of the United States Department of Agriculture office in Honolulu is responsible for the following activities: Meat inspection, inspection of imported meat and meat food products; specification

examination of meat and meat food products for designated agencies; cooperating in examination for the United States Navy; inspection, quarantine, and testing of import and export animals; supervision over importation of animal byproducts, hay, and straw; control and eradication of tuberculosis and Brucellosis in cattle.

ISLAND OF HAWAII

On Monday, November 17, the subcommittee went to the island of Hawaii, referred to as the Big Island. Here they made further observations and study of actual operations of many of Hawaii's sugar plantations.

Upon arrival at Hilo, T. H., subcommittee members were taken to Olaa Sugar Co., Ltd., where they were briefed on operations on the island of Hawaii. They were impressed with the great effort which is being made to bring land back into production at Olaa. They discussed with C. E. S. Burns, Jr., plantation manager at Olaa Sugar Co., crop logging as it applies to Olaa fertilizer requirements and land leveling and clearing at Olaa, and operating costs. Mr. Burns was requested by members of the subcommittee to submit a memorandum with regard to these subjects. His memorandum is a part of the appendix hereto attached.

The subcommittee visited the Macadamia nut orchards and were informed with regard to the cultivation, growth, and production of the orchards.

Members of the subcommittee were accompanied to the Hilo Sugar Plantation Co. by the manger, Mr. L. C. McLane, and by Mr. O. H. Lyman. Here they viewed field operations, visited the Hawaiian Sugar Planters' Association's seedling stations and the mill. They inspected the Kuhie bulk sugar plant, saw bagasse operations, and a demonstration of a cane carrier. Members of the committee were impressed by the in-field cane transporter at Hilo Sugar Plantation, which is an outstanding step which has been taken by Big Island plantations to increase sugar production.

The subcommittee was shown the tramway at Hutchison Sugar Plantation Co., which is used to bring down cane from the steep hills. They observed the combining of sugarcane cultivation and cattle raising at Hawaiian Agricultural Co., and also observed coffee growing and processing.

FARM BUREAU FEDERATION

The subcommittee met in Honolulu, T. H., on November 20, with officials of the Farm Bureau Federation and members. At this meeting the problems presented to the subcommittee were among those which came to the fore during a series of agricultural forums conducted by the new-industries committee of the Honolulu Chamber of Commerce earlier in the year 1952. These forums afforded the farmers an opportunity to meet together in an effort to work out some of their mutual problems. Members of the committee were informed that new attitudes of some of the large estates toward farm land tenure already appeared to be developing, possibly as a direct outcome of the forums.

Major proposals discussed at the above-mentioned meeting dealt with providing water, farm financing, price support for taro, formation of agricultural cooperatives and disaster rehabilitation assistance. It was apparent to members of the subcommittee that through organization of the farmers on the Hawiian Islands the welfare of Hawaii's farmers had been advanced. It is the belief of members of

the subcommittee that this will encourage production and marketing cooperatives and Hawaii's small farmer will obtain the maximum return from his work and the land they cultivate.

Farmers present at the meeting were encouraged by members of the subcommittee, who gave them hope that they would in the forseeable future be able to compete in the Hawaiian market with produce which is now imported from California and the Antipodes.

HAWAII AGRICULTURAL MOBILIZATION COMMITTEE

Mr. W. N. King, chairman, Hawaii Agricultural Mobilization Committee, submitted a statement in response to a request by the subcommittee. His statement contains recommendations for congressional assistance for Hawaii with reference to agricultural programs for greater self-sufficiency and listing of national programs not presently employed in Hawaii, with reasons. His full statement is a part of the appendix which follows this report.

CONCLUSIONS AND RECOMMENDATIONS

It is the conclusion of the subcommittee that there is a fertile field in the Hawaiian Islands for expansion of agricultural programs, and that there is necessity for expansion of agricultural research; that new production is essential to maintain a proper balance of trade. The subcommittee thinks that attention should be given to the rebuilding of Hawaii's once substantial rice-producing industry; that the incentives for new crops should be continued, and that such action as is necessary to preserve the well-established crops should be taken.

The subcommittee further believes that everything possible should be done to maintain ocean transportation of freight, essential to the welfare of the people and the economy of Hawaii; that consideration should be given to a survey of irrigation, power, and flood-control potentials in the Territory. Large areas of land could be brought under irrigation and made productive if financing could be obtained at a low rate of interest, with repayment over a long period of time, as is possible under the Reclamation Act.

The subcommittee thinks that further assistance through the Soil Conservation Service could be obtained from the national level in connection with the pasture-improvement program on the islands.

The subcommittee is of the further opinion that encouragement should be given in connection with agricultural expansion of the small-enterprise category. Subcommittee members found on the islands the problem of financing farm operations and developments and the need for production-credit assistance was evident, but requirements for Territorial eligibility are such that this assistance has not been within reach. Consideration should be given to a modification of the standards for use in Hawaii. The subcommittee feels that Hawaii's strategic position in the Pacific defense of the Nation warrants encouragement, and a reexamination of the standards to meet the needs of Hawaii would help encourage agricultural expansion of the small-enterprise category and assist the islands in becoming self-sufficient.

Hawaii is an American center and is an opportunity for bringing America's story closer to other countries of the world.

APPENDIX

Some Sugar-Production Problems in Hawaii on Plantations With High Rainfall

(By J. D. Bond, Hawaiian Sugar Planters' Association)

Four sugar plantations lie in a high-rainfall belt along the Hilo coast on the island of Hawaii. These, with the planters associated with them, cultivate about 28,600 acres of caneland and have produced an average of about 97,500 tons of 96° raw value sugar per annum since 1936. The annual rainfall recorded in this area during the past 10 years has averaged about 135 inches.

Early advantage was taken of the availability of water on these lands by using water power to drive the mills and to transport cane to the factories in V-shaped flumes. Steam engines long ago replaced water wheels as prime movers for turning mill rollers, but cane is still transported by water to a considerable extent, although trucks haul substantial tonnages of cane to the factories at the present time.

There was a distinct advantage, too, in receiving ample moisture through rainfall for maturing crops of sugarcane. Once the crop on a field shaded over the inter-row spaces, or closed in, there was nothing more to be done until harvest time or for a period perhaps as long as 12 months. In contrast, cane in dry areas must be tended and irrigated until shortly before harvest, requiring heavy expenditures for labor and for developed water.

So it was that so long as most of the work on Hawaiian sugar plantations was done by manpower, particularly in harvesting, plantations along the Hilo coast held a production cost advantage in spite of the fact that they were considerably outyielded by the dry, irrigated areas. The key to this situation lay in the availability of sufficient labor at wages commensurate with the total returns from sugar and molasses.

The areas occupied by these unirrigated plantations have been described as one of the richest belts of intensively cultivated nonirrigated properties in the world. Although this statement may have been somewhat exaggerated, nevertheless, as far as the Hawaiian sugar industry was concerned, the plantations involved were among the lowest cost producers until about 1940. Up to that time, the lowest cost producer of all Hawaiian sugar companies on an annual basis was not infrequently found to be one of the Hilo coast plantations.

During 1940 and 1941 three important factors adversely affected the Hawaiian sugar industry as a whole: a dwindling labor supply; a sharp advance in wage rates; and rapidly increasing costs of supplies of all kinds.

Although two Hilo coast plantations reported some shortage of labor as early as 1937, the situation in this regard was, as a whole, considered satisfactory in 1939. However, by 1942, the shortage of manpower was such that each plantation of this group had more mature cane than it could harvest in that year.

The loss of men was due to extended activities of the Armed Forces in the construction of facilities and to the appreciably higher wages paid for this work as compared with plantation rates. Inasmuch as the increased activities of the Armed Forces were centered on the island of Oahu, the loss of manpower was felt earlier and to a greater extent by the Oahu sugar plantations than by those on the other islands. It is thus significant that mechanical harvesting of sugarcane was developed as early as 1937 on the island of Oahu but was specifically adapted to dry, irrigated areas only. During the limited periods of rainfall which occurred on these plantations from time to time, the difficulties encountered with mechanical harvesting were so great that it was necessary to shut down until the soils had dried out sufficiently so that operations could continue.

This method of mechanical harvesting was rapidly adopted by the industry wherever applicable, but could not be used to advantage by the wet Hilo coast plantations. The loss of labor by these companies was thus a very serious matter.

Wage rates increased sharply in 1941 and the years following. The average daily earnings of the nonsupervisory employees of the industry as a whole are tabulated below from 1940 to 1945, inclusive. These do not include perquisites which were converted to cash in 1946.

Year:	*Average daily earnings*	Year—Continued	*Average daily earnings*
1940	$2.18	1943	$3.59
1941	2.48	1944	3.91
1942	2.90	1945	5.10

The labor costs per ton of 96° raw value sugar produced by the Hilo coast plantations by 4-year periods are estimated to the nearest dollar as follows:

Years:	*Labor costs per ton sugar*	Years—Continued	*Labor costs per ton sugar*
1936–39	$19	1944–47	$39
1940–43	23	1948–51	55

The average raw-sugar price increased from $76 per ton in 1936 to $121 in 1951, or about 68 percent. Labor costs per ton of sugar for the Hilo coast plantations, in contrast, increased about 189 percent.

In 1945 and 1946, these wet plantations as a group passed from the credit to the debit side of the ledger and had exhausted their own financial resources. This was aggravated by the strike of 1946, which lasted from September 1 to November 19 of that year. Financing was then necessary by the agents and by banks.

This situation was by no means unforeseen. Prior to the onset of World War II in 1941, the need for mechanizing the operations on these plantations was emphasized. In that year, some of the techniques used for harvesting cane on drier areas were given limited trial, using a cane rake pulled back and forth between two widely spaced tractors equipped with winches. It was apparent that this procedure was unsatisfactory.

A number of other procedures and pieces of equipment were subsequently attempted, such as—

Infield cane transport by the "magic carpet"—a canvas sled, later a sled of rubber belting, on which cane was piled and pulled by tractor.

Truck transport of cane to the factory preceded by the building of roads—used for hauling part of the crop at the present time.

Cane-fluming machines to feed cane into flumes in short lengths for water transport.

Cane rake hung on an overhead cable suspended between two cranes or cane loaders.

"Skyhook"—a method of infield transport of cane using a cane grab powered by an overhead trolley suspended on cables strung between large, guyed poles. This system was used in the lumber industry.

V-cutter—a device, pushed by tractor, resembling a snow plow designed to shear cane stalks off at ground level.

Walking sled and walking crane designed to reduce the ground pressure of equipment to load and transport cane in the field.

Aluminum flumes to reduce the labor needed in moving and laying portable flume. These aluminum flumes are presently in use on part of the area.

Cane cutters developed by the Experiment Station, HSPA, for drier areas. There is some limited direct application of this equipment to wet areas.

Most of these attempts, some of them very costly, were failures. None of them solved the problem of harvesting cane and transporting it out of the field. Perhaps more in desperation than in the hope of really successful application, mechanical harvesting procedures used in drier areas were given extensive application along the Hilo coast as soon as equipment could be procured during the war years. The results were:

Ruined stands of cane.
Resultant excessive weed growth.
Compacted and puddled soil.
Loss of top soil.
Excessive planting and replanting of cane.
Lowered grinding rates at the factories.
Trash disposal problems.

There have undoubtedly been yield losses in the succeeding crops from fields harvested mechanically in these wet areas. One plantation indicated a reduction in yield exceeding 2 tons of sugar per acre. Yet, the average yields of these plantations have held up rather better than might be expected. These averages by 4-year periods follow:

Years:	Tons sugar per acre 96° raw value	Years—Continued	Tons sugar per acre 96° raw val
1936–39	6. 3	1944–47	6. 7
1940–43	6. 1	1948–51	6. 2

Mechanical harvesting as practiced by the drier areas is obviously not the answer to this exceedingly difficult problem of the wet plantations. Nor can it be expected that equipment presently available from manufacturers will be the solution any more than the application of equipment and procedures used in other, drier cane areas.

Here is a problem which will be solved by steady research directed toward this specific objective. It appears at the present time, for example, that the infield transportation of cane by the "cane buggy," which has recently been developed for these wet conditions, is a substantial advance over any other previously known method. Similarly, it can be expected that a method of cutting cane will be forthcoming as well as a method of removing leafy trash from cane and leaving it where it belongs—in the field.

Crude though the procedures and methods used by this important segment of the Hawaiian sugar industry may seem at the present time, it must be borne in mind that this is only because the unique problems peculiar to this specific area demand special attention. They came into being rapidly at a time when trained men and materials were not available to adequately attack them.

The Hawaiian sugar industry as a whole has had difficult problems to meet in the past and new problems constantly arise. Had these problems not been met, the sugar industry would not be operating today; and the problems of today and of tomorrow must likewise be solved. The plight of the Hilo coast plantations should be considered in the same light.

Memorandum to the Honorable William S. Hill, Member of Congress, Second District of Colorado.

Re: (A) "Crop logging" as it applies to Olaa fertilizer requirements.
(B) Land leveling and clearing at Olaa.

CROP LOGGING

Crop logging is based upon the principle that the cane plant can be used as an indicator of its fertilizer requirement. Through many experiments, it has been found that there are levels of nitrogen, phosphate, potash, plant moisture, total sugar which must be maintained in order to assure maximum growth. In like manner, in order to achieve a state of maturity within the cane plant and to make it produce as much sugar as possible at harvest time, these same indices should be at levels in keeping with maturity.

In terms of nitrogen application, we apply approximately 40 pounds of nitrogen per acre with the seed at planting time. In 2 or 3 months after planting, depending upon the time of the year and variety, we apply another 60 pounds of nitrogen. In another 2 or 3 months, when the cane plant is some 8 or 10 months old, the final application of nitrogen is applied (about 90 pounds of nitrogen). From the time the plant is approximately 3 months old, monthly samples of leaf and leaf sheath tissue are taken which are used for analytical purposes and the percent of nitrogen determined. If we find that, when the plant is some 8 or 10 months of age, the nitrogen content is below certain minimum levels, instead of applying approximately 90 pounds of nitrogen, which is our standard, making 190 for the crop, we might either (1) apply 90 pounds with the idea of applying additional amount of nitrogen by airplane at a later date or (2) increase the application under consideration to perhaps a 100 or 120 pounds.

Crop logging gives us an opportunity to carefully study the amount of nitrogen in the plant and its utilization month by month. If we note that the nitrogen levels are falling more rapidly than we expect, the various applications are changed accordingly. Inasmuch as we cannot dry our fields prior to harvesting it is necessary that the cane plant run out of plant food on the approximate date of harvest. We can create a condition of maturity in our cane by allowing it to run out of plant food.

Potash is handled very much in the same manner and is applied on very much the same timing schedule but our total applications of potash are slightly higher. We apply about 300 to 325 pounds of potash per acre per crop as compared to approximately 190 pounds of nitrogen per acre per crop. Our crop averages approximately 21 months of age. Again the crop log indicates the potash levels

of the crop and if for any reason we note a decrease in the available potash in the plant, we apply more than our normal. If on the other hand, we find that the potash level is higher we apply less.

The total amount of sugar in the leaf sheath indicates to us the apparent state of maturity of the plant and in general we like to see low amounts of sugar up to approximately 15 or 17 months age, after that we like to see an increase in the amount of sugar content. Actually the sugar index is the result of the effect of nitrogen, phosphate, potash, and moisture on the cane plant, and is not a controlling index in itself.

The phosphate index is not used under our conditions for, the soil analysis of available phosphate is a better guide, however, we have been working experimentally with the phosphate index and hope to find another part of the plant which will be more accurate in the determination of the probable phosphate requirements of the plant.

At Olaa Sugar Co. on approximately 7,500 acres we spend approximately $280,000 on fertilizer material or slightly less than $40 per acre per year. Our average fertilizer applications are 190 pounds of nitrogen, 250 pounds of phosphate, and 325 pounds of potash. These constitute amounts of plant food and must not be confused with total pounds of fertilizer. We actually apply in terms of pounds of fertilizer material approximately 2,830 pounds per acre per crop.

LAND CLEARING

One of our major problems is to level the very uneven, rocky lands so that mechanical equipment can be used for cultivation, weed spraying, as well as harvesting.

A program has been instituted which calls for the levelling and clearing of approximately 1,600 acres per year. We are able under the soil conditions which exist here to bury the rock piles, level the ground, and to make our fields fairly uniform without destroying their yielding ability.

In the field trip that we took around Olaa, you were able to observe the clearing operations taking place under our very extreme weather conditions. As was pointed out to your group, the annual average rainfall at Olaa is 165 inches a year distributed throughout the year with no rainy or dry season—continually a rainy season.

OPERATING COSTS

We showed you that our operating costs in general were well within the comparative range of other plantations using the same accounting practices with the exception of the harvesting which was extremely high at Olaa. If we are able to successfully solve this problem, our costs should be fairly well in line with the other plantations.

We also pointed out to your group that payroll costs have increased tremendously over the last 22 years. We showed you a table which expressed annual payroll by years and the total number of employees as of January 1 of each year. The data showed that in 1930 we had 2,807 employees and they were paid a total of $978,966; by 1945 the number of employees had fallen to 1,316 but the annual payroll had gone up to $1,822,969. For the year 1952, we have 1,206 employees and they will earn approximately $3,150,000. During the period 1930 to 1952, the number of employees has gone down by more than half and our payroll has gone up more than three times.

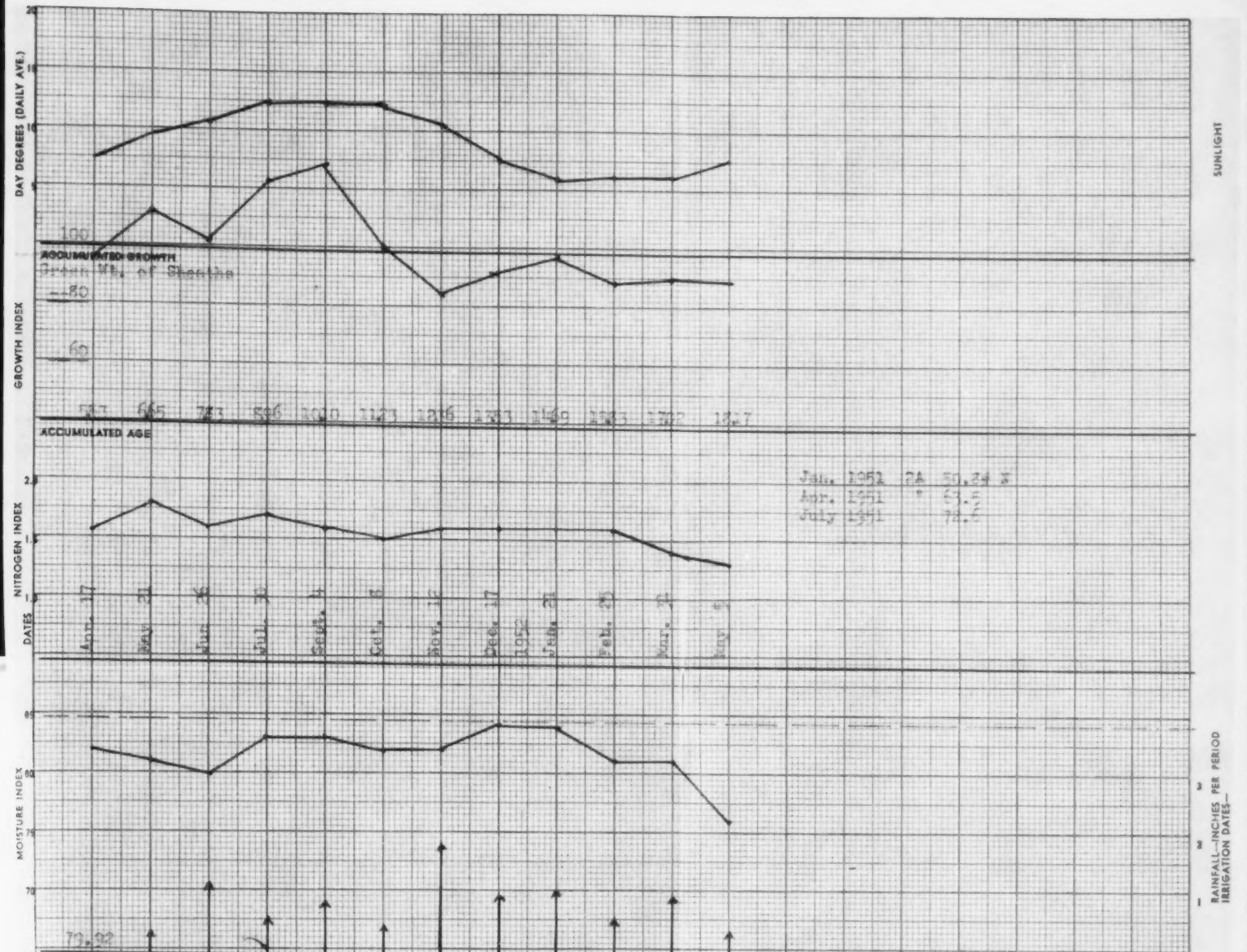
I attach a copy of one of our fields' crop log which serves as an example of the data accumulated for one field during a crop. Actually we have approximately 55 fields which are logged in this manner.

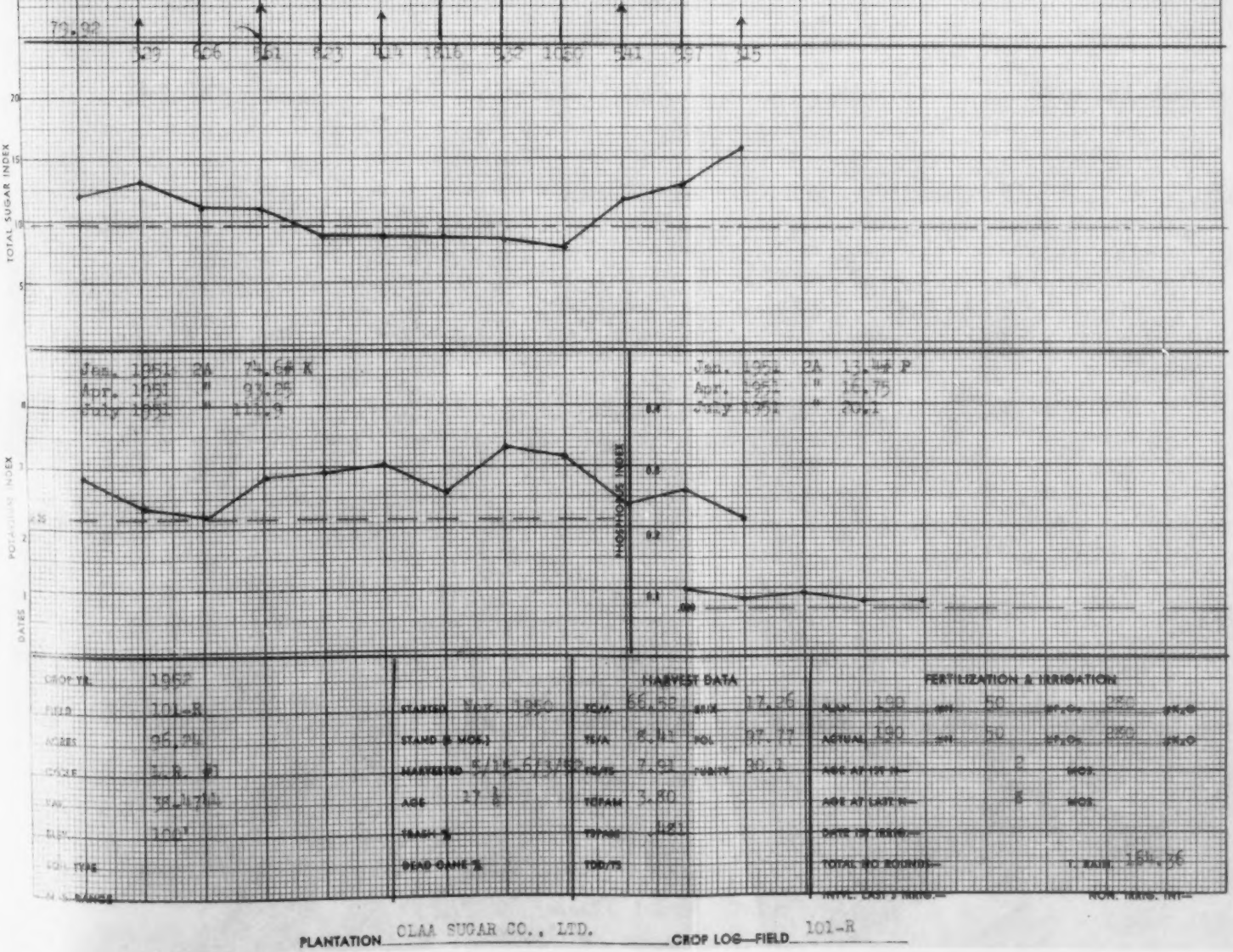
Oriental Fruitfly Investigations in Hawaii[1]

(Statement prepared by L. D. Christenson, in charge, investigations of fruitflies in Hawaii, Division of Fruit Insect Investigations, Bureau of Entomology and Plant Quarantine)

The alarming development of the oriental fruitfly to unusually serious pest proportions soon after it was first found in Hawaii in 1946 created a problem of grave concern to both mainland and island agricultural interests. The mainland

[1] Bureau of Entomology and Plant Quarantine, Agricultural Research Administration, U. S. Department of Agriculture, in cooperation with Territorial Board of Agriculture and Forestry, University of Hawaii Agricultural Experiment Station, Pineapple Research Institute, Hawaiian Sugar Planters' Association Experiment Station, and University of California Agricultural Experiment Station.


DAY DEGREES (DAILY AVE.)
ACCUMULATED GROWTH
GROWTH INDEX
ACCUMULATED AGE
NITROGEN INDEX
DATES
Apr. 17
May 31
Jun. 26
Jul. 30
Sept. 4
Oct. 8
Nov. 12
Dec. 17
Jan. 23
Feb. 28
Mar. 31
May 4
MOISTURE INDEX
SUNLIGHT
RAINFALL—INCHES PER PERIOD
IRRIGATION DATES—



CROP YR.	1962			HARVEST DATA				FERTILIZATION & IRRIGATION			
FIELD	101-R	STARTED	Nov. 1960	TC/A	66.62	SUC	17.26	PLAN.	190	NIT.	80
ACRES	96.24	STAND (MOS.)		TS/A	8.42	POL	87.77	ACTUAL	190	NIT.	80
CANE	2 R. #3	HARVESTED	5/14-6/1/62	TC/TS	7.91	PURITY	80.2	AGE AT 1ST N—			2
VAR.	28-47½	AGE	17½	TSH/AM	3.80			AGE AT LAST N—			8
ELEV.	10½	TRASH %		TSH/AC	1.01			DATE 1ST IRRIG.—			
SOIL TYPE		DEAD CANE %		TCH/TS				TOTAL NO ROUNDS—			
M. S. RANGE								INTVL. LAST 2 IRRIG.—			

problem arose from the menace of invasion of important fruit and vegetable producing areas on the mainland by this fly, and the urgent need for effective quarantine safeguards to prevent its introduction, for a prior knowledge of effective procedures for eradicating or controlling the pest should an incipient infestation be discovered, and for effective commodity treatments that would permit an orderly movement to market of large quantities of fresh fruits and vegetables that might be produced in an infested area. The island problem was concerned with the almost total destruction of many kinds of fruits and vegetables important to the local economy, the immediate need for means to abate these losses, and the need for effective quarantine treatments that would permit resumption of the normal, expanding mainland trade in certain fresh fruits and vegetables infested by the fruitfly.

After initial independent research by various private, Federal, and Territorial agencies, which included explorations of foreign areas for fruitfly parasites initiated by the Territorial Board of Agriculture and Forestry, a fully cooperative biological control campaign was inaugurated on July 1, 1948. A comprehensive study of all phases of the new fruitfly problem came into being on July 1, 1949, under the leadership of Walter Carter, who also directed the activities of the Bureau organization. This expanded research program was a fully cooperative venture with the participating agencies sharing or having full responsibility for various lines of work.

The oriental fruitfly investigations conducted in Hawaii have included detailed biological, ecological, bioclimatic, nutritional, taxonomic, and physiological studies, a biological control campaign, which included a worldwide search for effective parasites and the development of methods for the mass production of fruitflies and their parasites, a program to develop information to serve as a basis for the establishment of sound quarantine safeguards, the development of commodity treatments for eliminating fruitfly infestations in fresh fruits and vegetables to permit their movement in normal trade channels, studies to find effective insecticides, lures, or repellents, and practical ways for utilizing them in fruitfly control, and studies to develop procedures for the area control of fruitflies and to determine the feasibility of eradicating incipient infestations. The research program was designed to meet as fully as possible the needs of both island and mainland agriculture.

Several of the original objectives of the cooperative oriental fruitfly investigations have been realized and a great deal of progress toward attainment of others is apparent. Even though substantial oriental fruitfly infestations are still the rule, introduced parasites established in Hawaii have greatly lessened the severity of the problem there. Many of the fruits attractive to the fly are less heavily infested now and have considerable value even when allowed to ripen before picking. Formerly they were almost worthless because of heavy infestations. The marked reduction in the number of flies found in nonhost areas such as airports and shipping terminals has also reduced the possibility of chance infestations of the oriental fruitfly reaching California and other subtropical areas on the mainland. Methods for the mass production of fruitflies and their parasites are available in the event there is ever a need for a fruitfly biological control program in continental United States, and there is a nearby source of parasites in Hawaii.

The discovery that ethylene dibromide is an effective fruitfly fumigant and its application to the commodity treatment problem in Hawaii has permitted an increase in the export trade in fresh papaya and pineapples, and other fruits and vegetables, from a few thousand pounds in 1948 to about 3 million pounds in 1952. In the event of a mainland fruitfly infestation, this, and other treatments and modifications that may be developed in the meantime, will be available for immediate application to the new problem. Biological studies, which proved conclusively that the Vanda Miss Agnes Joaquim orchid is not a host of the oriental fruitfly eliminated the necessity for a quarantine treatment for this important commercial flower.

Several effective fruitfly insecticides and formulations have been discovered, including a new bait spray containing a hydrolysate of yeast or soy. The work with these materials is still in a developmental stage, but the preliminary results have been sufficiently promising to give assurance to mainland growers that they will have some means of coping with any fruitfly emergency that may develop. A large-scale area control experiment encompassing the entire island of Lanai, in which various insecticidal formulations, methods, and types of equipment were tested, demonstrated that eradication of an incipient oriental fruitfly infestation is entirely feasible. The tendency of the oriental fruitfly to move about freely and its capacity for long-distance flight was a disturbing factor, however, suggesting that it may be exceedingly difficult to contain an infestation for long unless

natural barriers to spread intercede or the incipient infestation is promptly suppressed.

In the fruitfly lure studies, uses for methyl eugenol, a powerful male oriental fruitfly attractant, have been developed or are being investigated. This material is the attractant now being used in traps in California to detect at the earliest possible moment incipient infestations that may occur, and in traps in Hawaii to measure population trends. Experiments have shown that substantial reductions in fruitfly infestations may be obtained by using methyl eugenol to attract the male flies to poisoned feeding stations where they are killed before they are able to fertilize the females. An effective proteinaceous lure attractive to both sexes of fruitflies, but one that is much less powerful than methyl eugenol, is in an advanced developmental stage.

Preliminary results of ecological and bioclimatic cabinet studies have suggested that the subtropical mainland area suitable for the oriental fruitfly may be considerably less than originally supposed. The development of this fly has been inhibited by the winter conditions of all California climates which have been simulated in special cabinets. Of the three fruitflies in Hawaii of interest to mainland agriculture, the melonfly has exhibited a somewhat higher degree of tolerance to subtropical climatic extremes than the oriental fruitfly or Mediterranean fruitfly, and the present indications are that it is potentially a greater menace to agriculture in the Pacific coast area of the mainland than either of the other two fruitflies.

Biological and ecological studies have contributed a great deal of basic information on the life histories, movement habits, host preferences, and responses to various environmental factors, including competition between species, of the three Hawaiian fruitflies. This constitutes an informational background of significant value in the development of sound control practices and establishment of effective quarantine safeguards. Physiological studies have provided precise measurements of the effect of light intensity on oviposition of the oriental fruitfly and of the temperature preferenda. The physiological studies have also provided fundamental information with respect to the cholinesterase systems of the fruitflies, and have thrown considerable light on the mode of action of certain anticholinesterase insecticides. Other studies have provided an indication of the potential ability of the oriental fruitfly to develop resistance to DDT, one of the insecticides that may be useful if control of this fruitfly on the mainland is ever required. Nutritional studies have yielded information important to all phases of the investigations.

With the realization of some of the objectives of the oriental fruitfly investigations there have been curtailments in certain lines of work and others have been eliminated. In the remaining cooperative studies emphasis is being placed on research related to the further evaluation and development of effective chemical-control measures, lures or repellents, the development of commodity treatments to greater actual and potential usefulness, bioclimatic studies to evaluate the mainland pest potentials of the three fruitflies in Hawaii, and the evaluation of the spread and establishment of introduced parasites and of the effectiveness of these and other natural control agents. Certain phases of the field ecology and biology studies are also being continued to fill in important gaps in our knowledge of the biology of the fruitflies, and to provide population trend data essential for an evaluation of the residual fruitfly problem with its many ramifications. Studies to improve quarantine safeguards and a reevaluation of certain fruitfly hosts to determine changes in status in response to variable population densities of fruitflies and the risk involved in their exportation to mainland markets, have likewise been inescapable obligations. A few of the introduced parasites are still being propagated and distributed in the hope that their establishment can be secured. In these studies, increasing attention is being devoted to the melonfly and Mediterranean fruitfly and to practical problems of significance to the economy of the Hawaiian Islands.

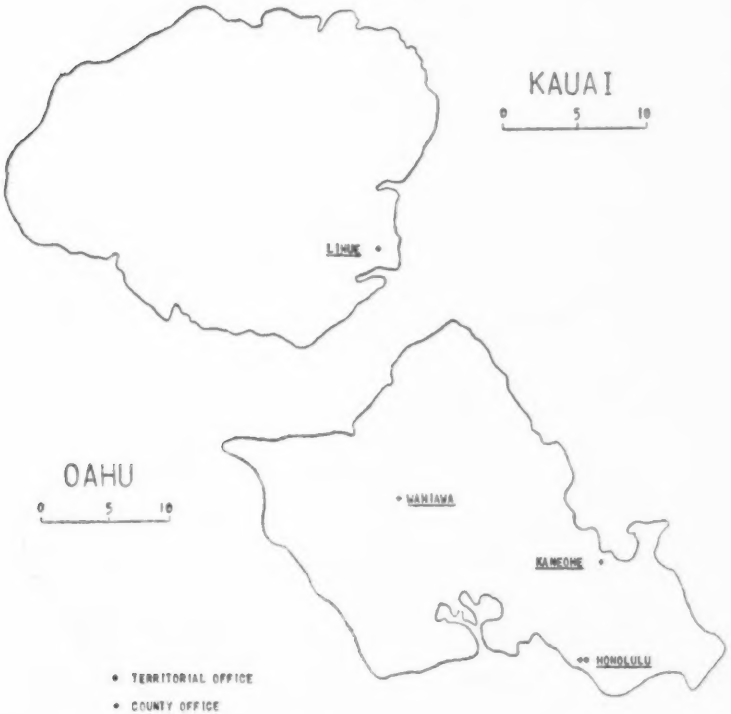
From both the island and mainland viewpoints, the emergency created by the oriental fruitfly in Hawaii has been greatly relieved by the research progress that has been made. However, the many difficulties that are being encountered in the application of quarantine treatments and in the experimental use of promising chemical-control procedures in Hawaii, the substantial oriental fruitfly infestations which still occur, and the potential menace of the Mediterranean fruitfly and melonfly to mainland agriculture, provide indisputable evidence that our research has not as yet provided entirely satisfactory answers to all of the many difficult fruitfly problems.

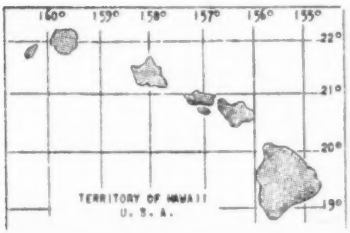
REPORT SUBMITTED TO MEMBERS OF HOUSE AGRICULTURAL COMMITTEE VISITING HAWAII, NOVEMBER 1952

By Baron Goto, Associate Director, Agricultural Extension Service, University of Hawaii, Honolulu, T. H.

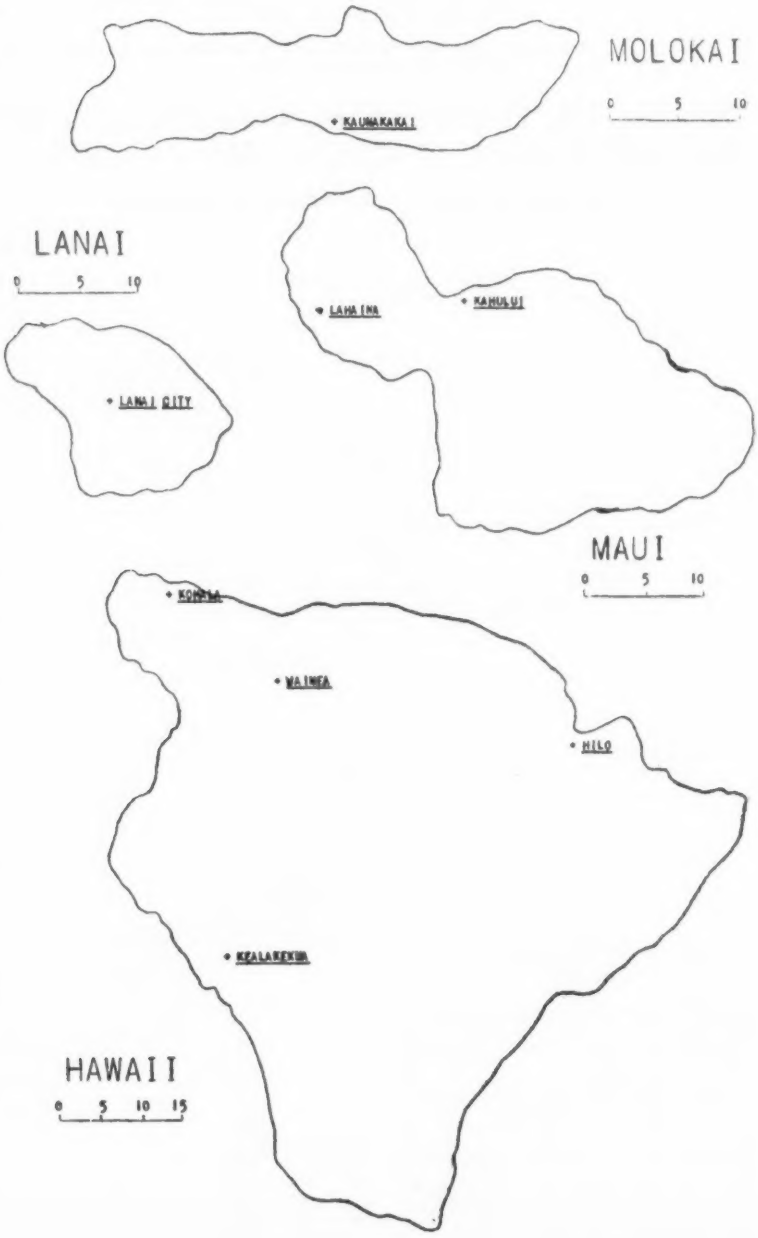
COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS - TERRITORY OF HAWAII

UNIVERSITY OF HAWAII - U. S. DEPARTMENT OF AGRICULTURE

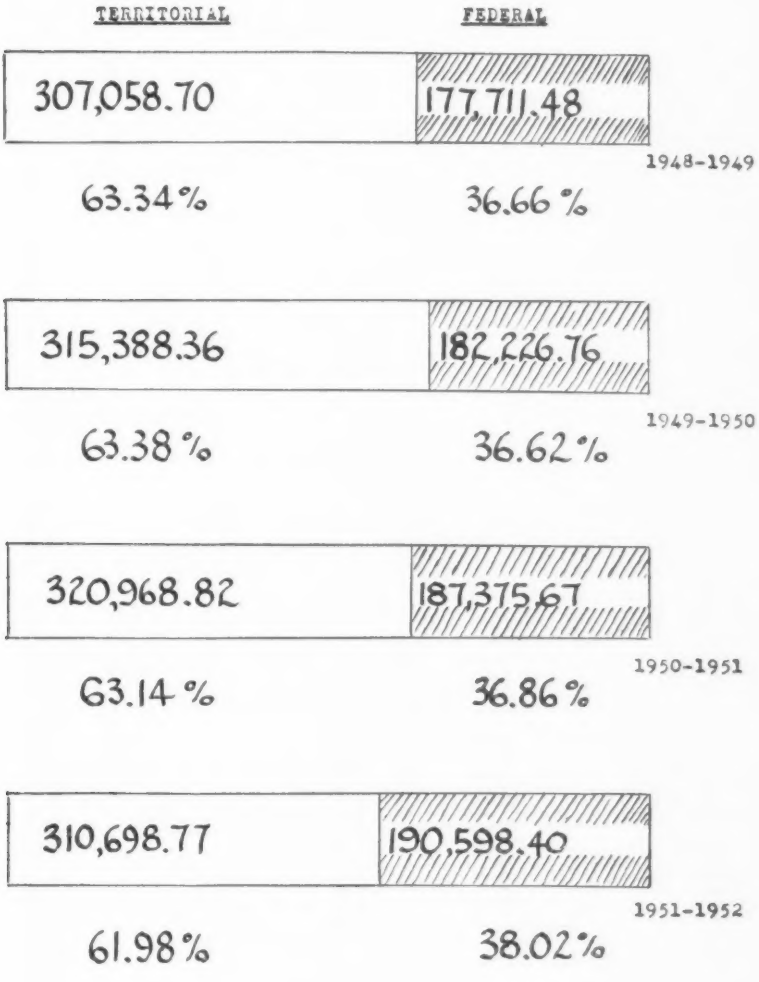


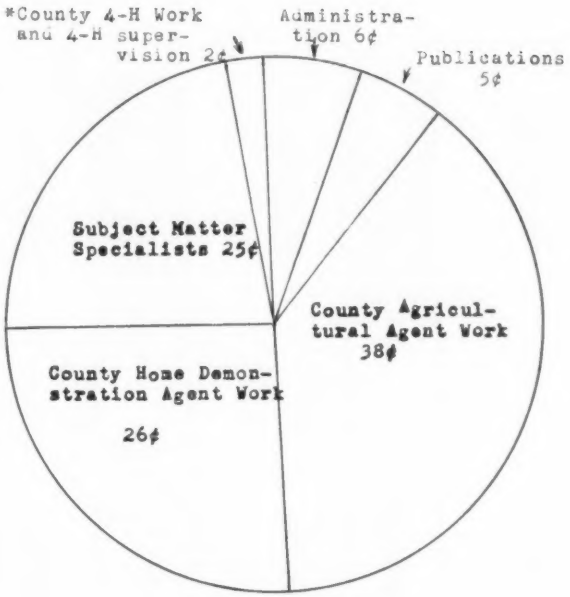


	AREA
TERRITORY ...	6,435
HAWAII	4,030
MAUI	728
MOLOKAI	260
OAHU	604
KAUAI	555
OTHERS	258

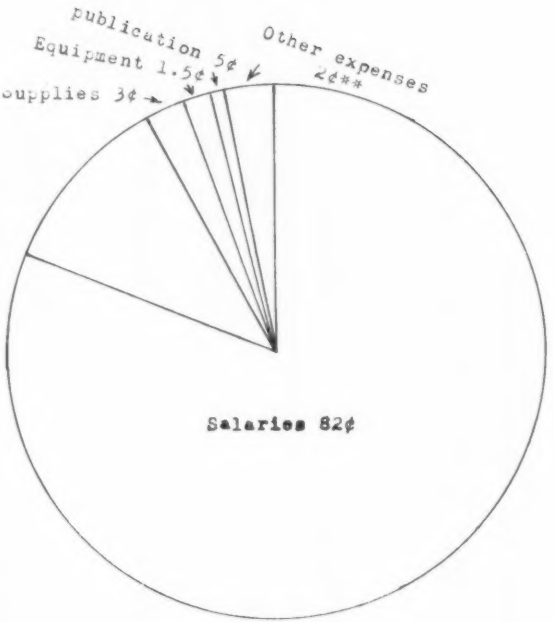

MOLOKAI
0 5 10
KAUNAKAKAI
LANAI
0 5 10
LANAI CITY
LAHAINA
KAHULUI
MAUI
0 5 10
KOHALA
WAIMEA
HILO
KEALAKEKUA
HAWAII
0 5 10 15

ANNUAL CONTRIBUTIONS: FEDERAL AND TERRITORIAL SOURCES




*County 4-H Work and 4-H supervision 2¢
Administration 6¢
Publications 5¢
Subject Matter Specialists 25¢
County Agricultural Agent Work 38¢
County Home Demonstration Agent Work 26¢

By Lines of Work

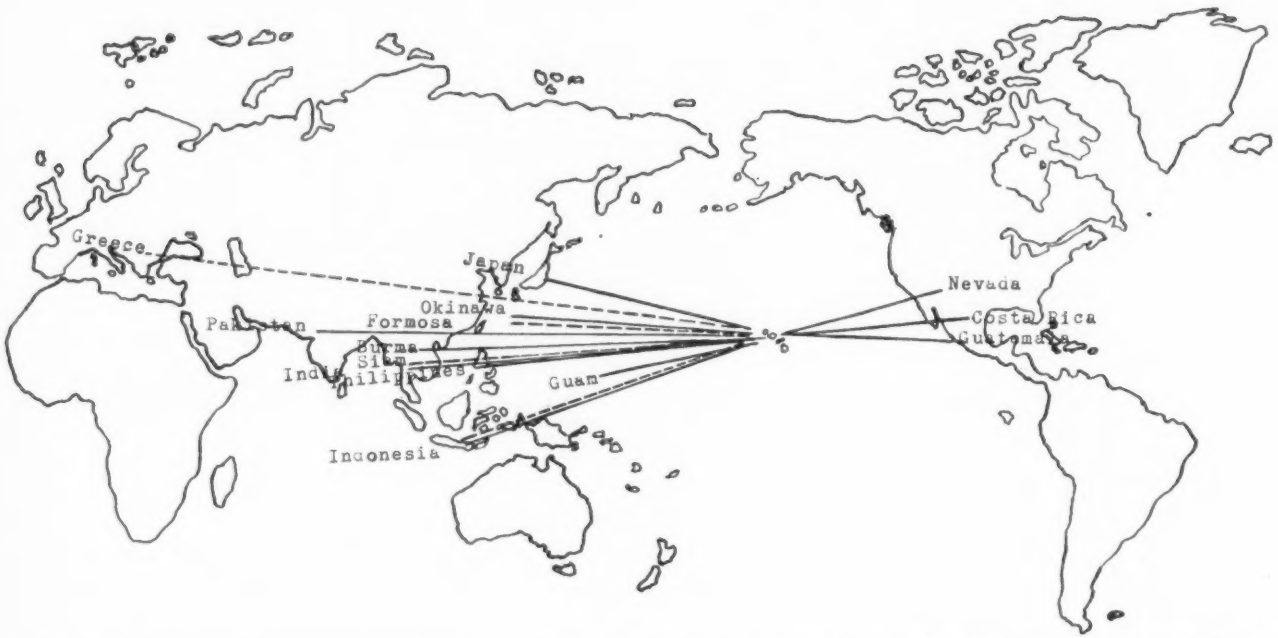


By Nature of Expense

*Includes supervision and 4-H club work of these agents.
**Includes communication services, repairs to equipment, rents, utilities, miscellaneous.

4–H Club work:	
Clubs	330
Members	4, 344
Home demonstration work:	
Clubs	176
Members	3, 000
Farm and home visits	39, 330
Telephone calls	17, 277
Extension literature distributed (copies)	419, 513
All extension meetings held:	
Number of meetings	9, 562
Attendance	179, 695

NOTE.—These figures are for calendar year 1951 only.



Solid lines indicate trainees from foreign countries who received Extension training in Hawaii. Broken lines indicate location of Hawaii Extension workers who taught Extension methods in foreign countries. They are: Miss Feagin, Greece; Mr. Bembower, Thailand; and Mr. Warner, Indonesia. Miss Feagin also was on loan to Okinawa for 6 months; Mr. Murphy, 1 year. (Mr. Bembower and Mr. Warner have both resigned.)

UNITED STATES DEPARTMENT OF AGRICULTURE,
AGRICULTURAL RESEARCH ADMINISTRATION,
BUREAU OF ANIMAL INDUSTRY,
Honolulu 13, T. H.

General aims and purposes of the Bureau of Animal Industry, United States Department of Agriculture, are to conduct, research, and administer a program primarily concerned with the protection and development of the livestock industry of the United States; conducts scientific investigations of the causes, prevention, and treatment of diseases and parasites of domestic animals, investigates the existence of such maladies, and directs or aids in their control or eradication; carries on experiments in the breeding and feeding of domestic animals, including poultry and fur-bearing animals raised in captivity, and studies methods of improving the quality and usefulness of their products; administers Federal acts regarding animal quarantine, diseased-animal transportation, and virus-serum-toxin; administers the Meat Inspection Act, the Horse Meat Act, the Imported Meat Act, and the 28-hour law.

The Bureau of Animal Industry Division of the United States Department of Agriculture office in Honolulu is responsible for the following activities: Meat inspection, inspection of imported meat and meat food products; specification examination of meat and meat food products for designated agencies; cooperating in examination for the United States Navy; inspection, quarantine, and testing of import and export animals; supervision over importation of animal byproducts, hay and straw; control and eradication of tuberculosis and brucellosis in cattle.

MEAT INSPECTION

Under the Meat Inspection Act this office is engaged principally in—

(1) The examination of food animals, including cattle, calves, sheep, swine, goats, and horses prior to slaughter to eliminate those animals found to be affected with disease or other unwholesome conditions.

(2) A thorough post mortem examination of each carcass at time of slaughter to detect and eliminate diseased and otherwise unfit meat.

(3) Destruction for food purposes of all diseased, unsound, or otherwise unwholesome meat and meat byproducts.

(4) Supervision of the preparation of meat food products to assure their cleanliness and wholesomeness during their preparation into articles of food.

(5) Guarding against the use of harmful preservatives and other deleterious ingredients.

(6) Supervision of the application of marks to meat and meat food products to show that they are "U. S. inspected and passed."

(7) Supervision of the application of informative labeling and prevention of the use of false and deceptive labeling on meat and meat food products.

(8) Certification of meat and meat food products for export.

(9) Inspection of meat and meat food products offered for importation into this country.

(10) Examination of meat and meat food products for compliance with specification requirements of governmental purchasing agents.

(11) Such investigations as are necessary to insure the accuracy and effectiveness of the inspection procedures.

BUREAU OF ANIMAL INDUSTRY ORDERS

In addition to the responsibilities of administering the Meat Inspection Act, the Import Meat Act, the Horse Meat Act and the 28-hour law, this office has the responsibility of administering the following Bureau of Animal Industry orders:

Bureau of Animal Industry Order 305

This order restricts the importation of foreign animal casings. No casings from a foreign country shall be admitted into this country unless they are accompanied by a certificate signed by an official of the national government having jurisdiction over the health of the animals in the country of origin. Uncertified animal casings arriving in the United States are consigned, under customs custody, to an establishment approved by the Bureau of Animal Industry to receive and disinfect such casings before they can be released for consumption entry.

Bureau of Animal Industry Order 309

This order regulates the interstate movement of cattle, sheep, swine, goats, and other animals as well as poultry. It specifically prohibits the interstate movement

of diseased animals. Further, this order sets up provisions for free areas, quarantined areas, the duties and responsibilities of the carriers of livestock and poultry. The disinfection, cleaning, and inspection of yards and premises, cars, boats, pens, chutes, and equipment used in handling animals in interstate commerce is covered by this order. The slaughter of animals to prevent the spread of contagious, infectious, or communicable disease is provided for by this order, as well as the prohibition of shipping dead animals with live ones in interstate commerce.

Bureau of Animal Industry Order 361

This order provides for the handling of anti-hog-cholera serum and hog-cholera virus. This order sets up the duties of manufacturers, distributors, handlers, marketing, and control of anti-hog-cholera serum and hog-cholera virus, products used in the immunization of swine against hog cholera, manufactured and marketed in compliance with standards and regulations promulgated by the United States Department of Agriculture.

Bureau of Animal Industry Order 371

The purpose of this regulation is to prevent the introduction from foreign countries into the United States of communicable diseases of livestock. This regulation prohibits the importation of any animal byproduct taken or removed from an animal affected with anthrax, foot-and-mouth disease, or rinderpest. This regulation sets forth the requirements unrestricted and restricted entry of hides, skins, wool, hair, bristles, glue stock, bones, horns, hoofs, bone-meal, blood meal, tankage, glands, organs, as well as hay and straw for feeding and bedding purposes. It also provides for the cleaning and disinfection of cars, vehicles, boats, yards, premises, containers, and implements and equipment used in handling restricted animal byproducts from foreign countries.

Bureau of Animal Industry Order 373

This order is to prevent the introduction into the United States of rinderpest, foot-and-mouth disease, fowl pest, and Newcastle disease. It prohibits the importation into this country of fresh, chilled, or frozen meat or product from goats, wild swine, wild ruminants originating in any country designated by the Secretary of Agriculture as being not free from rinderpest or foot-and-mouth disease. This order provides for the restricted entry of certain cured meats which must be consigned in customs custody to an establishment approved for the receiving and further processing of such restricted meats and meat food products in compliance with the law. Under this order, garbage from ships which have on board as sea stores, meat and meat food products derived from ruminants and swine which originated in countries not declared to be free from foot-and-mouth disease, is prohibited from unloading such garbage in the territorial waters of the United States. Such garbage may come ashore under the supervision of this office for incineration.

Bureau of Animal Industry Order 375

The purpose of the order is prevention of animal diseases in cooperation with States. Owners of animals slaughtered because of reacting to tuberculosis, paratuberculosis, and Bang's disease may receive indemnity for the loss of their animals if, at the time of their condemnation the cattle were in a State, Territory, county, municipality in which cooperative tuberculosis, paratuberculosis or Bang's disease eradication work was being conducted. This order sets forth the conditions and requirements that must be closely followed in order for indemnity payments to be received for the loss of reacting cattle.

Bureau of Animal Industry Order 376

This order refers to the diseases of foot-and-mouth disease, pleuropneumonia, rinderpest, and other contagious and infectious animal diseases. Like BAI Order 375, this order provides for the payments of indemnities paid to owners of animals slaughtered because of the above-listed diseases. Cooperative agreements between States and Territories are a part of the requirements to receiving indemnities. Should the contagious, communicable, and infectious disease of foot-and-mouth disease make its presence known in the United States or its Territories, this is the BAI order which would be set in motion for the huge indemnity payments which it is expected would be incurred before this dreaded animal disease would be stamped out.

Bureau of Animal Industry Order 378

This regulation governs the inspection, humane treatment, and safe transport of animals for export. No animals shall be exported to any foreign country

until they have been inspected in a manner prescribed by the Chief of the Bureau and found to be free from evidence of communicable disease or exposure thereto, or until they have been tested in a manner prescribed by the said Chief. This regulation provided for the rest, feed, and water of animals before being loaded for export, as well as the feed, water, care, and handling during the voyage. It also provides for the dimensions, facilities, and accommodations for humane treatment of animals, according to their size and species. Special consideration is given to those animals in advanced pregnancy. After animals offered for export have been inspected, as well as the accommodations which they will occupy, certification is issued by this office.

Bureau of Animal Industry Order 379

This regulation governs the inspection and quarantine and the recognition of breeds and books of record, of livestock and other animals offered for importation. This order sets forth the requirements for importing into the United States animals, by a citizen of the United States, especially for breeding purposes, free of duty. It provides that no animal shall be admitted free unless purebred of a recognized breed and duly registered in a book of record recognized by the Secretary of Agriculture for that breed. Animals which are amenable to this order are cattle, sheep, goats, other ruminants, swine, asses, mules, zebras and dogs; all animals which chew a cud such as cattle, buffaloes, sheep, goats, deer, antelopes, camels, llamas, and giraffes.

Bureau of Animal Industry Order 381

This order deals with viruses, serums, toxins, and analogous products; organisms and vectors. It makes provision for licenses and permits to import biological products into the United States. Further, this order provides that no organisms or vectors shall be imported into the United States or transported from one State or Territory or the District of Columbia without a permit issued by the Secretary.

By close cooperation with the Territorial government which has to do with the health of the animals in the Hawaiian Islands, the purpose has been accomplished which is to prevent the introduction into the United States of diseased animals from foreign countries and the spread of contagious, infectious diseases such as foot-and-mouth disease and rinderpest etc., by supervision of meats and meat food products and animal byproducts offered for entry here.

The aims and purposes of this office are to continue to administer the laws and regulations of the United States Department of Agriculture which pertain to the Bureau of Animal Industry in such a manner that there will be, as far as humanly possible, no outbreak of infectious or communicable disease which might endanger the welfare of our livestock industry.

The personnel at this station consists of Dr. A. H. Julien, veterinary meat and livestock inspector (in charge); John L. Kaseburg, imported meats and animal byproducts inspector.

UNITED STATES DEPARTMENT OF AGRICULTURE,
PRODUCTION AND MARKETING ADMINISTRATION,
Honolulu 13, T. H., November 19, 1952.

CHAIRMAN, CONGRESSIONAL SUBCOMMITTEE ON AGRICULTURE,
Honolulu, T. H.

SIR: In response to the November 15 request of your subcommittee for a brief statement from the Hawaii Agricultural Mobilization Committee of the United States Department of Agriculture on recommendations for congressional assistance for Hawaii in reference to (1) agricultural programs for greater self-sufficiency, (2) listing of national programs not presently employed in Hawaii, with reasons; there is submitted the following:

Whereas:

(1) Hawaii is a United States Pacific outpost 2,000 miles from the nearest mainland (meaning it is 2,000 to 5,000 miles from principal markets and sources of supply);

(2) It has a position of strategic importance in—
  (*a*) national defense;
  (*b*) extension of the point 4 program to the Orient;

(3) Is highly dependent on transocean shipping for—
  (*a*) many necessities of life in a high standard society;
  (*b*) exporting of marketable commodities;

(4) Self-sustenance of the Territory is constantly jeopardized and deleteriously influenced by—

(*a*) commercial competition with low cost and surplus producing areas of the whole United States mainland;

(*b*) frequent and sometimes protracted shipping stoppages due to sailor and longshore strikes;

(5) Production of truck crops is highly susceptible to vagaries of weather as well as mainland competition hence not infrequently results in temporary surpluses;

(6) The size of this island community (outside of corporate agricultural industry) is insufficient to cope with the problem of financing and developing phases of its diversified agriculture conducive to sustenance:

Therefore it is recommended that assistance of the Congress, or established departments and agencies where applicable, be secured to:

I. Maintain at all times ocean transportation of freight essential to the welfare of the people of Hawaii by extension to Pacific Ocean shipping of executive powers, presently applicable to mainland railroads, to insure operations under emergency conditions.

II. Encourage through financing loans the—

(*a*) Construction of suitable bulk food and feed storage facilities in the islands to store on a rotational basis 3 or 4 months' supplies of concentrate feeds and rough rice and to reduce cost of handling (RFC or CCC loans);

(*b*) Initial purchase and transportation of needed commodities for such storage (CCC loans);

(*c*) Going and new farm projects for production of more foods and feeds for island use (through effectuation of Production Credit Association facilities).

III. Encourage through grants of aid—

(*a*) More research on production problems (rice, ekoa, alfalfa, etc.) (title II, Research and Marketing Act);

(*b*) Stabilization of farm income through prompt and controlled Government purchase of temporary surpluses of perishable produce for use in school lunch and food distribution programs (see sec. 416, Agricultural Act of 1949, also sec. 32, act of 1935).

IV. Establish in Hawaii a point 4 institute of the Pacific area—

(*a*) To involve countries of—

(1) Polynesia
(2) North Asia
(3) Southeast Asia
(4) India, Pakistan, Africa
(5) Other tropical areas

(*b*) For purposes of—

(1) Orientation of foreign technicians visiting the United States;
(2) Orientation of American technicians going to foreign countries.

(*c*) With competent staff, buildings, and facilities supplementing present set-up at University of Hawaii campus.

(*d*) To start with $1 million.

Listed below are national agricultural programs potentially helpful to Hawaii but not presently in use for the reasons shown:

(1) Price support program for "agricultural food commodities which are in danger of deterioration or spoilage before they can be disposed of in normal domestic channels." (Honey is only crop thus far applicable in Hawaii. Others conceivably might be made so if specifications are met.)

(2) Surplus removal programs: Under section 32 of act of August 24, 1935, "PMA purchases surplus commodities and makes them available to school lunch programs, institutions," etc., and makes payments to encourage diversion of surplus commodities from normal channels of trade to new markets and new uses (probably can be effected after working out procedural details with Food Distribution Programs Branch. Needed to save temporary truck-crop surpluses and establish greater farmer confidence).

(3) Warehousing programs: Under CCC, PMA carries out storage facilities operations through—

(1) Purchasing equipment for storage of CCC grains;
(2) Making loans for construction of farm storage;
(3) Other undertakings as may be necessary.

(Details not known but can be obtained from CCC. All 3 items needed especially by poultry, hog, and dairy producers.)

(4) Water facility loan (FHA) for conservation and utilization of land and water resources through development of wells, ponds, etc., and distribution and irrigation systems (so far applicable only to 17 western States. But why not Hawaii also? Needed to encourage expansion of area for cultivated crop production).

(5) Production Credit Association to provide short-term credit for all types of farm and ranch operations. (This is much needed for purchase of feed, livestock, irrigation equipment, etc. Restricted from use in Hawaii so far because cost of administration is estimated too high [$40,000 per year] for amount of estimated loan business [$1,250,000]. HAMC believes cost can be reduced materially through use of office facilities and personnel of other USDA agencies here.)

(6) REA loans:

(*a*) Rural electric systems construction through long-term loans generally to farm co-ops and associations (Applicable in Hawaii where group action requirements may be met. Lack of initiative on part of parties directly concerned has so far resulted in no action beyond original inquiry. Need is not great as few rural communities in Hawaii are now without current.)

(*b*) Wiring, appliances, and plumbing loans of 5-year duration. Funds ordinarily lent through REA financed power distributors (of which there are none in Hawaii).

Respectfully submitted.

HAWAII AGRICULTURAL MOBILIZATION COMMITTEE,
By WILL N. KING, *Chairman.*

PRODUCTION AND MARKETING ADMINISTRATION

(By W. N. King, Production and Marketing Administration)

The PMA organization in Hawaii is set up as an area office with headquarters in Honolulu, a branch office in Hilo, and individual part-time farmer representatives on Maui and Kauai. It is responsible to the Assistant Administrator for Production in D. C. The county committee system is not in effect here as yet. Of the 14 persons staffing the organization all are of local origin and training except 2. On each of the five important islands is an advisory committee of farmers to assist particularly in designing the ACP.

The Hawaiian area office is responsible for administration in the territory of (1) the Sugar Act, (2) the agricultural conservation program, (3) the school lunch and direct distribution program, and (4) leadership of the Hawaii agricultural mobilization committee.

SUGAR

Administration of the Sugar Act of 1948 is in close collaboration with the Sugar Branch in Washington and concerns essentially (1) the determination of compliance by producers of sugar cane respecting minimum wages paid for labor, hiring of children and payment by processors of agreed-upon prices for the purchase of sugar cane from individual planters, (2) the processing of applications for payment under the act from 28 plantation farms and (in 1951) from 840 independent small planters. Checking compliance and processing applications is virtually a year-round operation and for reason of the very heavy proportion of planters on the island of Hawaii is confined largely to that island.

Payments under the act, based on raw sugar produced, total approximately $9,000,000 a year. Of this amount independent planters receive about $1,000,000. A second group of small planters numbering about 300 and designated "adherents" for the reason they "adhere" to plantations for economic and other support, receive about $120,000. The number of adherents are expected to decrease with time and the independents increase, as net returns, substantially aided by benefit payments, favor independence. (Benefit payments to independents run close to $16 a ton of sugar and to adherents $6.) Sugar produced in 1951 by all plantation farms totaled 916,000 tons; by independent planters 60,000 tons; by adherents 20,000.

ACP

This program of financial aid to farmers for the performance of soil-conservation practices has been in effect in Hawaii for 17 years. It has the distinction of being the only soil-conservation program maintained here throughout the war period.

Patterned after mainland standards but designed to suit local conditions and requirements the program offers payments to encourage the performance of about 40 different soil- and water-conserving practices each year. Participation in the program is by some 1,200 large and small farm enterprises and to the extent of some $200,000 of payments each year. Practices for use on cattle ranches (clearing, seeding, etc.) which operate on 1,400,000 acres of land, account for roughly three-fourths of all the payments. Cultivated lands include some 300,000 acres, 73 percent of which is in sugarcane, 22 percent in pineapples, and 5 percent in diversified crops. Main conservation practices here are organic mulching, terracing, and control of moisture through irrigation and drainage.

Since last year and again following the national pattern, the SCS has taken an important part in operation of the program through application of its technical services on permanent-type practices. Close and effective cooperation between PMA and SCS is being accomplished in this work.

HAWAII AGRICULTURAL MOBILIZATION COMMITTEE (USDA COUNCIL)

This organization, through secretarial instruction headed by the PMA Director, consists of nine members of both USDA agencies and related Territorial agencies. Represented are Soil Conservation Service, Bureau of Entomology and Plant Quarantine (both Quarantine and Research Divisions), Animal Industry, Farmers Home Administration, Production and Marketing Administration, Territorial Board of Agriculture and Forestry, Agricultural Extension Service, and Division of Vocational Agriculture of Territorial DPI (Department of Public Instruction).

Meetings are held regularly at bimonthly intervals to acquaint members with various program developments, to conduct surveys requested by the Secretary and to promote as far as possible the solution of problems confronting local agriculture.

High among the problems is that of financing farm operations and developments. The need for production credit assistance is evident but requirements for Territorial eligibility are such as to put this help out of reach. Modified standards for use in Hawaii would help break this bottleneck. It appears to us Hawaii's strategic position in the Pacific defense of the Nation warrants greater encouragement, through financing loans, of the means to self-sustenance.

SCHOOL LUNCH AND DIRECT DISTRIBUTION PROGRAM IN HAWAII

As representative of the Food Distribution Branch of the USDA, the Hawaiian PMA area office has administered these two programs in the islands. The National School Lunch Act, Public Law No. 396, 79th Congress, dated June 4, 1946, established the program on a permanent basis whereas it had been operating on a year-to-year basis since 1935 under section 32, Public Law 320, 74th Congress, as to food distribution and since 1943 with cash indemnity to schools. Hawaii has participated in these programs since their inception. The School Lunch Act of 1946 limited the amount of cash indemnity to Hawaii's schools by virtue of a provision which tied our participation to that of Puerto Rico and the Virgin Islands. Under this provision not more than 3 percent of the total appropriation was made available to Alaska, Hawaii, Puerto Rico and the Virgin Islands and this 3 percent was to be divided among these areas on the basis of school-age population and per capita income. Due to the low per capita income in Puerto Rico and the Virgin Islands as compared to Hawaii our share was disproportionately lower than comparable States. Fortunately the act was amended by Congress last session by the passage of Delegate Farrington's bill, and next year Hawaii will participate on the same basis as the States. We anticipate that this will mean about $150,000 more cash indemnity to our schools. This year we are receiving only $90,899 in cash permitting only one-half cent indemnity to the DPI schools. In contrast Idaho with about the same number of school-age children but far less daily participation receives $298,371. Hawaii has, however, received its share of food purchased under section 6 of the act and any price support purchases under section 32 on the same basis as the States. The value of such foods this year may be around $300,000 and include such commodities as dry milk, pinto beans, smoked hams, canned snapbeans, processed cheese, tomato paste, canned peas, canned peaches, and frozen turkeys.

There are at present 154 public schools and 11 private shools in Hawaii participating under the National School Lunch Act with an average daily lunch participation of about 75,000 children. Hawaii's percentage of participation in relation to enrollment in the public schools is the highest in the United States.

In addition section 32 commodities are distributed to 25 eligible institutions with a participation of about 10,000. The only section 32 commodity received this year for these participants is dried milk.

Occasional short-time surpluses of local farm products of a perishable nature has suggested more than once the desirability of a quick-acting mechanism by which commodities of good quality might be channeled to schools and other government institutions in the islands. Present lengthy procedure is too slow for practical purposes.

Report to Subcommittee on Agriculture

House of Representatives, Eighty-second Congress

(By C. G. Lennox, president, Board of Agriculture and Forestry, Territory of Hawaii, November 15, 1952)

FUNCTIONS AND ACTIVITIES OF THE BOARD OF AGRICULTURE AND FORESTRY, TERRITORY OF HAWAII

Functions normally handled by a State department of agriculture are vested in the Territorial board of agriculture and forestry. These are briefly:

The supervision of animal health and animal quarantines is through a corps of veterinarians established on all islands of the Territory. Bovine tuberculosis control is conducted through this organization with indemnities paid on animals ordered for slaughter from Territorial funds and Federal funds matched up to a total of $25 per animal. This organization enforces regulations relative to entry of animals into the Territory as well as between islands of the Territory. They are well designed and easily enforced because of water barriers at borders.

Crop pest problems of local significance are investigated and measures taken for their control. Problems that become of national importance have received Federal assistance through supplementary work projects. The fruitfly project is a case in point.

Plant quarantine inspection relates particularly to the inspection of horticultural material offered for entry from the United States ports. Collaboration with the Federal inspectors managing the inspection of foreign imports as well as clearing exports to mainland sources is well integrated, with no overlap of personnel performing similar functions. Territorial inspectors function as Federal inspectors and vice versa where it is economic to do so.

Laws relating to agricultural seeds, economic poisons, feeding stuffs, labeling and grading of fresh vegetables, fruits and eggs, as well as the use of herbicides, are all enforced by agents employed through this Territorial activity.

Such functions sometimes carried on by State departments of agriculture such as milk inspection, meat inspection, weights and measure inspection, are performed by the department of health or county organizations.

Territorial appropriations to support the above-described functions amount to approximately $330,000. No material Federal support is obtained directly to aid in supporting these programs.

The forest reserves and the forestry resources of the Territory are managed entirely by this same board. No administrative assistance is obtained from the United States Forest Service, although approximately $10,000 is obtained annually from Federal funds under the Clarke-McNary and Norris-Doxey Acts as grants-in-aid for forest-fire prevention and distribution of forest trees to farmers. More than a million acres, or one-fourth of the total land area of the Territory, is in forest reserves, with more than 900,000 acres managed as watersheds for the protection of the Territory's irrigation and domestic water supplies. The balance of the area is managed for its timber products, game or recreational values, or for soil protection. About 830,000 acres are Government lands and the balance privately owned lands placed under the protective custody of the Territory. Total annual expenditures for forest protection and management is over $300,000.

FEDERAL ASSISTANCE WHICH WILL AID AGRICULTURAL EXPANSION IN HAWAII

Irrigation

A growing population requiring employment mandates a full examination of all opportunities to increase wealth and employment opportunity from the existing resources of the Territory. The lands under intensive cultivation constitute 7 percent of the total land area. Eighty-eight percent of this area is under two

crops: sugarcane and pineapples. The Territory is far from self-sufficient in food crops required by its population.

Opportunity to expand production of food crops rests to a large extent with the opportunity to bring irrigation water to dry areas of present low production capacity. Although private enterprise has invested over $40 million in irrigation works, these investments have been made where repayment is assured in a relatively short period.

Large areas of land still remain which could be brought under irrigation if financing is at a low rate of interest and repayment is over a long period of time, as is possible under the Reclamation Act. Legislation introduced at the last Congress would have permitted the Bureau of Reclamation to make a full survey of irrigation, power, and flood-control potentials in the Territory. It failed in the Senate. This assistance on the Federal level will materially expand the opportunity to evaluate the potentials of further land cultivation in Hawaii and is badly needed.

Storage of livestock feeds

The dairy, poultry, and swine industries in Hawaii are depended upon imports of concentrates. Moreover, their products do not meet Territorial consumption requirements. The approximate percentage of total consumption coming from local production of each is as follows: pork, 60 percent; eggs, 61 percent; fluid milk, 25 to 35 percent. No cheese or butter produced locally.

The expansion of these livestock enterprises to meet local consumption is depended upon a lower cost of livestock feeds and an assured supply. Interruptions of water transportation have created serious hardships to all of these enterprises and in some cases resulted in slaughtering of herds to meet deficient feed supplies during maritime strikes. Federal assistance, through loans from the Reconstruction Finance Corporation for building of bulk-storage facilities for livestock feeds to be stockpiled, and a revision of the authority vested in the Commodity Credit Corporation to permit storage of grains in such facilities will materially aid in meeting the problems of these livestock enterprises and permit them to expand to meet consumption demands.

Pasture improvement

Approximately one-third of the Territorial land is under pasture for the growing of beef cattle. However, only 65 percent of local consumption comes from beef produced in the islands. With the high price of beef and good income of recent years pasture-improvement programs are progressing more rapidly, and heavier production of beef can be anticipated. Material assistance through the Soil Conservation Service can be obtained from the national level in guiding and assisting with the pasture-improvement program. This is obtained to some extent at present and more is needed.

General

Hawaii presents very different conditions, agriculturally speaking, than most States—isolation from other production and consumption areas by 2,000 miles of ocean and dependence upon ocean vessels only for moving of heavy freight; a highly industrialized and self-financed agricultural pattern for the two major crops; relative minor role in terms of land and wealth played by all crops outside of sugar and pineapples—these factors, and others, have made it difficult or impossible to translate Federal farmer-assistance programs to Hawaii under the standards set for the States. A reexamination of these standards to meet the needs of Hawaii would aid in encouraging agricultural expansion of the small-enterprise category and assist these islands in becoming more nearly self-sufficient.

A Report on the Functions of the Honolulu Office of the Division of Plant Quarantines Prepared for the Congressional Subcommittee on Agriculture

(By K. L. Maehler, inspector in charge)

The Division of Plant Quarantines within the Bureau of Entomology and Plant Quarantine is delegated with the responsibility of protecting the agriculture of the mainland and Hawaii from the introduction of insects and plant diseases. This function is accomplished by the enforcement of quarantines and regulations promulgated by the Secretary of Agriculture.

The efficacies of plant quarantines are based on the premise that insects established in new areas frequently leave behind those elements responsible for keeping

them in check in their native home. For this reason, many of our worst pests are immigrants from distant places.

Quarantine philsosphy does not presume that it is possible to keep every single piece of prohibited material out of our country. Fortunately, quarantines are aided by all the natural phenomena which tend to prevent a new insect from becoming established. The possibility of an insect becoming established is mathematically dependent upon the number of times it is allowed to enter the country. Quarantines, then, may be likened to a large dam which holds back an immense amount of water. Small trickles may bypass the dam, but because of their size they usually dry up. Quarantines reduce the possibility of an insect's becoming established by reducing the number of times it may be introduceed.

Operationally, our forces are divided so that we may inspect material moving by air, by ship, mail, express, baggage, and cargo. We clear planes for three airports: Hickam Field, Honolulu International Airport, and Barber's Point. In addition to the inspection of the aircraft and passenger's baggage, we spray all aircraft arriving from foreign areas and all those destined for the mainland. We also have a cooperative agreement with the Australian and New Zealand Governments to give planes departing for their countries the same clearance as we require for mainland departures. We cleared 17,198 aircraft in fiscal year 1952 and covered all airfields 24 hours a day. Our inspectors intercepted a total of 16,796 lots of contraband material. Our standards are high, and many of these men are trained entomologists, botanists, horticulturists, plant pathologists, as well as being quarantine men.

Our maritime inspection covers all foreign arriving ships at Pearl Harbor and Honolulu Harbor. A good bit of the traffic is Navy personnel and ships which are well indoctrinated with our requirements.

Mail inspection is carried on at the Honolulu Post Office, Hickam Field, and Fort Shafter. We clear all mail moving from Hawaii to the mainland. Last year we opened a total of 185,911 packages. Frequently, infested mangoes, coffee beans, and other fruit, seeds, and plants are intercepted destined to Florida, California, Texas, and other areas where the insects could possibly establish themselves.

During the war the oriental fruitfly established itself in Hawaii, and that made three economically important fruitflies—the melon fly, which apparently was introduced from the Orient about 55 years ago in Chinese baggage, and the Mediterranean fruitfly, which is believed to have come into Hawaii in apples from Australia about 45 years ago. Quarantine 13 protects the mainland from these species, and the oriental fruitfly investigation has as its function the research on these flies and recommending commodity treatments. Last year we supervised the treatment of 3,000,000 pounds of pineapple as well as large quantities of papaya for mainland shipment.

I have briefly outlined our main operations in Honolulu. We also have an office in Hilo and a man stationed on Guam whose function is to survey pests, agriculture, and quarantine needs in that area.

We work closely with the Plant Inspection Office of the Territory of Hawaii Board of Agriculture and Forestry, and they in turn cooperate with us in certain features of our work.

As inspector in charge, I work under the direction of the area supervisor, Mr. Charles E. Cooley, in San Francisco, whose area includes California, the Hawaiian Islands and Guam, a sizable amount of territory.

UNITED STATES DEPARTMENT OF AGRICULTURE,
SOIL CONSERVATION SERVICE,
Honolulu, T. H., November 14, 1952.

Congressman WILLIAM S. HILL,
Congressman CHARLES B. HOEVEN,
Congressman HAROLD O. LOVRE,
Royal Hawaiian Hotel, Honolulu, T. H.

GENTLEMEN: As you gentlemen know, funds appropriated for the Soil Conservation Service are largely earmarked for technical assistance to soil-conservation districts. Therefore, you will be interested in the soil-conservation-district situation in Hawaii.

Prior to World War II, a small staff under the direction of Dr. N. E. Winters did considerable soils-survey work and conservation-practice demonstrations in the islands. Shortly after Pearl Harbor, it was decided to temporarily stop Soil Conservation Service work in the Territory.

A soil-conservation-district law was passed by the Territorial legislature at the 1947 session and was signed into law by the Governor on May 19, 1947. There are now nine soil-conservation districts located on four of the islands. Following is a list of these districts:

Name of district	Island	Date organized	Acres
Olinda-Kula	Maui	Apr. 2, 1948	15,000
Waimanalo	Oahu	June 7, 1948	5,000
Molokai	Molokai	Aug. 19, 1948	167,000
Waiakea	Hawaii	Sept. 6, 1949	10,000
West Oahu	Oahu	Jan. 4, 1950	149,000
Koolau	do	Mar. 4, 1950	72,000
Kau	Hawaii	Oct. 3, 1950	663,000
Puna	do	do	325,000
Total			1,406,000

The ninth district was voted in on September 30, 1952, and has not yet completed its organization. It is called the South Oahu Soil Conservation District.

As an indication of the solid support behind the formation of these districts, the vote in the nine referenda was 5,585 in favor of the district and 1 vote opposed.

You may also be interested in our progress in staffing to assist these districts. At the time the law was passed, there was one Soil Conservation Service employee in the Territory. At the end of 1947, there were 3 employees; 1948, 10 employees; 1949, 19 employees; 1950, 21 employees; 1951, 20 employees; and at this date, 21 employees. Early personnel were necessarily recruited by transfer from the mainland. At the present time 50 percent of the staff was recruited in the islands. The early transfers were necessary for training purposes, but excellent soil-scientist and engineering graduates from the University of Hawaii are now being used for staffing. As district development continues, it is not anticipated there will be any considerable increase in staff, as some of the earlier districts will be approaching a maintenance status.

You may be interested in the fields in which these employees function. There are five soil scientists, three agronomists, three engineers, two range specialists, three conservation aides, three clerk-stenographers, one administrative assistant and draftsman, and the Territorial conservationist.

One of the most significant developments in the work was the establishment of a nursery unit in the islands within the last few weeks. One of the purposes of this unit is to stimulate seed production, which is so badly needed in the Territory. There will also be trials and adaptations of new grasses and legumes, as well as some studies in fertilization.

Progress was somewhat slow and difficult in the early stages, as there was a great deal of educational work needed. Furthermore, ranchers and farmers could not be taken to neighboring counties or States to observe soil-conservation districts in action, as could so easily be done on the mainland. There seems to be, however, complete understanding of the program at the present time.

We have no complaints with regard to the share of appropriated Soil Conservation Service funds which have been provided to Hawaii. If I were asked to name any particular problems with which we are faced, there is only about one which has been serious. We do not have aerial photograph coverage for a number of sections, and these are badly needed.

Attached you will find a summary report as of June 30, 1952, of work done in the Territory.

In closing, may I stress the very fine cooperative relationships which exist in Hawaii between government agencies. The university extension service, the university experiment station, the Territorial board of agriculture and forestry, and the Production and Marketing Administration have been conspicuously friendly and cooperative with the Soil Conservation Service.

Respectfully yours.

WALTER E. SYKES,
Territorial Conservationist.

Form SCS-195 (Revised 1-1-48)

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

COPY

WORK REPORT

Block A — **Location and Period of Report** — FISCAL YEAR 1952

District 8 districts reporting (Name) SCD (Number) Territory of Hawaii ~~State~~

Headquarters Honolulu, T. H. Period from 7/1/51 to 6/30, 1952

Block B — **Farm and Ranch Conservation Plans and Treatment**

CONSERVATION PLANS (1)	NUMBER This Period (2)	NUMBER To Date (3)	ACRES This Period (4)	ACRES To Date (5)	(6)
1. Applications received	170	650	139,666	310,423	
2. Active applications	x x x x x x x	76	x x x x x x x	46,950	
3. Plans prepared and signed	163	539	25,602	118,621	
4. Plans canceled (—)	23	44	180	377	
5. Amended plans (+ or — Ac.)	5	9	743	735	
6. Active conservation plans	x x x x x x	495	x x x x x x	118,989	
7. Combined treatment	x x x x x x x	x x x x x x	5,788	44,230	
8. Plans on maintenance	20	21	136	316	
9. Initial & Advanced Agree. (1 - 14)		14	(3,500	107,453	
10. Plans being applied July—Dec.	112	423	107,453)	x x x x x x	
" " " Jan.—June	205				

Block C — **Major Soil and Water Conservation Practices, Farm and Ranch Plans**

PRACTICES (1)	UNIT (1a)	PLANNED This Period (2)	PLANNED To Date (3)	APPLIED This Period (4)	APPLIED To Date (5)	(6)
Contour farming	Acres	1,691	5,317	930	3,078	
Cover cropping	Acres	1,064	4,509	978	1,748	
Stubble mulching	Acres	1,749	5,511	1,078	3,239	
Strip cropping	Acres	38	395		24	
Range improvement	Acres	28,390	103,426	2,010	46,060	
Pasture improvement	Acres	3,428	6,649	1,023	1,555	
Seeding of range	Acres	11,792	25,857	1,362	1,667	
Seeding of pasture	Acres	2,738	5,328	684	1,120	
Wildlife area improvement	Acres	200	200	200	200	
Woodland management	Acres	200	699	30	30	
Tree planting	Acres	7	71	7	7	
Farm and ranch ponds	No.	15	30	1	9	
Terraces	Miles	21	106	5	20	
Field diversions	Miles	42	202	12	71	
Farm drainage	Acres	1,374	1,762	63	136	
Closed drains	L. Ft.					
Open drains	Miles	19	51	6	18	
Irrigation land preparation	Acres	29	207	25	139	
Improved water application	Acres	1,020	3,175	633	1,813	
Field wind breaks	Miles	5	66	7	15	
Cross Slope Farming	Acres	175	195	175	195	
Seeding Gr.&/or Legumes	Acres	5	1,831	3	150	
Protective Seedings	Acres	269	298	43	57	
Irrigation Systems	Acres	364	1,626	376	1,342	
Irrigation Systems	No.	56	225	53	199	
Land Improved by Irrig.	Acres	10	168	15	99	

16-43423-2

Block D **Distribution of SCS Technical Time (This Period)**

ITEMS	MAN-HOURS (Permanent and part-time employees)				
	P-3	P-1 and 2	SP	TOTAL	
1. Planning farms					
2. Application					
3. Maintenance					
4. Group enterprises					
5. F. C. work plans					
6. Conservation surveys					
7. Information					
8. Conservation education					
9. Cooperative relations					
10. In-service training					
11. Administration					
12. Technical material					
13.					
14. Leave (sick and annual)					
15. TOTAL MAN-HOURS					
16.					

Block E **Soil Conservation, Other Surveys; and Flood Control**

TYPE OF SURVEY	THIS PERIOD		TO DATE	SUBWATERSHED WORK PLANS	
	MAN-HOURS	ACRES	ACRES	THIS PERIOD	TO DATE
1. Farm planning A	1,731	61,910	196,531	No.	
2. Farm planning B				Ac.	
3. Basic surveys					
4. Reconnaissance				Name of Watershed	
5.					
6.					

Block F **Statements of Progress and Footnotes**

(SIGNED) Walter Hughes

(TITLE) Territorial Conservationist

(ADDRESS) Honolulu, T. H.

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